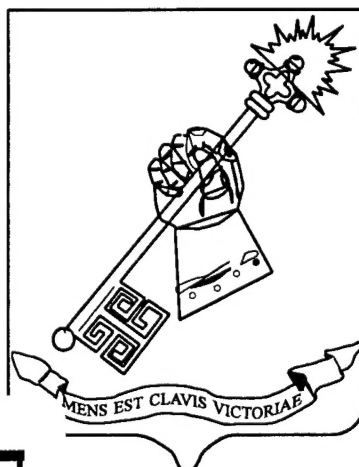


HUMAN INTELLIGENCE: Long-Range Surveillance for FORCE XXI

A Monograph
By
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Infantry



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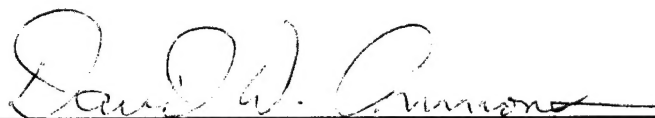
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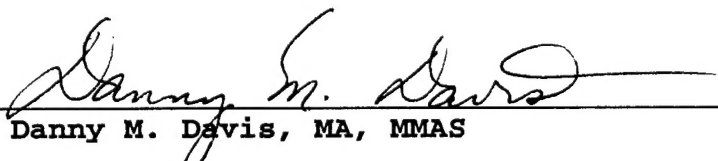
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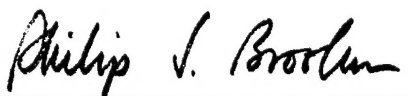
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ABSTRACT

HUMAN INTELLIGENCE: Long-Range Surveillance for Force XXI, by MAJ Lewis C. Cochran, USA, 52 pages.

This monograph examines the utility of long-range surveillance human intelligence as part of a larger intelligence gathering system. The paper proposes that even with the acquisition of high-technology intelligence gathering systems, such as Unmanned Aerial Vehicles (UAV) and the Joint Surveillance Target Attack Radar System (JSTARS), Long-Range Surveillance Units (LRSU) are still an essential part of the system. LRSU do have significant problems associated with their employment currently. The most significant problems are communications equipment, doctrine and organization. These elements limit LRSU effectiveness now and in the future within the framework of FORCE XXI operations.

This monograph contains seven sections: introduction, history of LRSU, the Revolution in Military Affairs (RMA), LRSU doctrine, FORCE XXI operations, LRSU for FORCE XXI, and conclusion. The history section sheds light on the origins of the LRSU mission through World War II, Korea, Vietnam and the 9th Infantry Division test unit of the early 1980's. The section on the RMA examines the problems with LRSU equipment, specifically communications, and how the RMA may affect it. It also examines the future viability of the UAV and JSTARS as examples of advanced technology made possible by the RMA. The fourth section, LRSU doctrine, reveals its origins and the revision of the doctrine in 1992. It establishes the base line for future challenges for LRSU within FORCE XXI. The FORCE XXI section explains the characteristics of those operations and how LRSU are and are not prepared to support them. The LRSU for FORCE XXI section details how present companies and detachments can be combined into battalion level organizations to solve the problems associated with supporting future operations. The conclusion provides a synthesis of the problems facing LRSU and the solutions to enable them to effectively support FORCE XXI operations.

The monograph concludes that LRSU, and forerunner units of this type, have suffered because of a traditional dislike of elite units, rapid demobilization, and the failure to capture doctrinal lessons learned. The current RMA can provide solutions to the problems associated with LRSU communications. Additionally, the paper concludes that the U.S. Army intelligence gathering system still needs LRSU, despite the promise of UAVs and JSTARS. Finally, the study concludes that LRSU doctrine is flawed in its present form and to fix it requires the reorganization of existing companies and detachments into battalion level structures. If these proposals are implemented, LRSU will continue to be a vital part of the intelligence gathering system.

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Introduction

Richard Simpkin in 1986 wrote in Race to the Swift: Thoughts on Twenty-First Century Warfare, "With modern artillery and air support, a pair of eyes backed up by an unjammable radio and perhaps a thermal imager becomes the equivalent of at least a (company) combat team, perhaps a battle group."¹ In future context this might also include the operator of an Unmanned Aerial Vehicle (UAV), the radar operator of the Joint Surveillance Target Attack Radar System (JSTARS), or even the foreign language interpreter/operator for a communications intercept system. These alternatives to the man with binoculars and a radio make him seem antiquated, and by inference, obsolete in an army based on the latest technology.

Man possesses what technology can never give the commander; the ultimate in intelligence, inherent flexibility, reaction in accordance with intent, and ingenuity. The man with the binoculars and radio at the tactical level is the scout, at the tactical and operational levels the Long-Range Surveillance Units (LRSU) team member, and at the strategic level the Special Forces soldier. The effectiveness of these soldiers in providing Human Intelligence (HUMINT) on the battlefield has been proven time and again. To justify the continuing need for the services of these soldiers is not a pedantic exercise, but an absolutely necessary one in the environment the U.S. Army now faces. The Army faces an environment characterized by extreme uncertainty - no readily identifiable enemy and a steadily decreasing budget.

It is the purpose of this paper to establish that LRSU are still a valuable intelligence gathering system. LRSU are part of a system critical to support of the Force XXI vision, and one which can capitalize on the current Revolution in Military Affairs (RMA) technologies. Additionally, this paper will provide the framework for a new organizational structure and doctrinal concepts. The proposed new organizational structure and doctrine will alleviate many of the current problems with LRSU and make it a valuable contributor to FORCE XXI operations. Inherent to the argument is that LRSU are a vital part of a

complex intelligence gathering system that can produce a coherent battlefield picture to the commander. This paper will examine the historical background of the LRSU mission and organization; the effect the RMA will have on the intelligence system, specifically LRSU; and the problems with the current doctrine and organization. Finally, it will propose doctrine and an organization to support Force XXI operations that is radically different from current concepts.

LRSU have many attractive features that make them a valuable component of the intelligence gathering system. LRSU provide highly reliable HUMINT at a much lower cost, both in terms of personnel and dollars, than advanced technology-based intelligence gathering systems. Additionally, in some battlefield environments, HUMINT, and LRSU in particular, may be the most consistently effective intelligence gathering system available to the commander. Other benefits are: little sanitation of gathered intelligence prior to dissemination, the ability to work effectively in joint and combined environments, and the ability to make effective use of the National Guard component of the Army.

LRSU entered the U.S. Army force structure in 1985. Shortcomings in their doctrine and organizations have plagued them ever since. Doctrinal discussions have focused on such issues as parent unit organization and who will pay for modernization instead of operational issues. LRSU specific doctrine has changed very little while other doctrinal concepts and technology have continued to advance. LRSU organization and equipment are virtually unchanged since 1985.

The legacy of modern LRSU lie in the Vietnam War Long-Range Reconnaissance Patrol (LRRP) units. LRRPs often provided the commander his only reliable battlefield intelligence, yet they were inactivated following the end of the Vietnam War primarily due to force reduction, the failure of the Army to capture doctrinal lessons, and the traditional dislike of elite units. These reasons will be explained in the second section on background history. LRRPs were reactivated in the form of LRSU during the force expansion in the mid 1980s. Each division and corps received a unit in recognition of the need for a reliable

HUMINT capability. Like LRRPs, LRSU, and similar Special Operations HUMINT collection systems, have proven their capability to provide reliable intelligence in exercises and in combat. Their usefulness is now once again in question however, as high-technology intelligence gathering systems become more capable.

Technological innovations such as UAVs and JSTARS seem destined to dominate future intelligence gathering operations. These systems provide a combat-proven capability for intelligence collection at both the tactical and operational levels. Yet their shortcomings are also significant: high cost (and resultant low numbers), heavy support requirements, limited flexibility and survivability. These systems proved their capabilities during Operation Desert Shield/Desert Storm in an environment that was conducive to their employment and maximized their contribution. Their effectiveness in other regions of the world is questionable. UAVs and JSTARS provide an enhanced capability to support the intelligence needs of the commander. However, they must combine with other intelligence gathering systems to form a coherent battlefield intelligence system. LRSU provide an additional critical and complementary asset but have shortcomings in their current state.

Current problems include an inflexible operational doctrine and an organization that prevents separate LRSU from operating together effectively. The revised FM 7-73, Long-Range Surveillance Unit Operations, fixes some of the problems of inflexible doctrine. The new manual, however, still does not fix the underlying issues. Organizational and doctrinal shortfalls are perpetuated by a lack of guidance and concern by the proponent. The Infantry Center is the doctrinal proponent for LRSU. As the proponent representative, only the company commander of the Long Range Surveillance Leaders Course at the Infantry School works issues full time. Most of his time, however, is devoted to running the course. LRSU doctrine and organization therefore go largely unattended by the proponent.

Each unit has its own Standard Operating Procedure (SOP) for Command, Control, Communications and Computers (C4). Differences in SOPs inhibit coordination and

flexible employment between LRSU of different parent organizations. Each unit also has its own C4 architecture, contributing to the inability of the units to coordinate their efforts. Redesigning the current organization, combined with development of an appropriate doctrine, would promote the flexible employment that is critical to LRSU effectiveness to support Force XXI operations and make effective use of the RMA.

Rangers Lead the Way

LRSU history is linked to both the Ranger battalions and long-range patrol units of World War II, the Ranger companies of Korea, and the long-range patrols of Vietnam. These organizations proved their effectiveness as combat and intelligence units and were the forerunners of what has come to be known as Special Operations Forces (SOF). LRSU are not Special Operations Forces, but the history of these units identify historical trends that still affect LRSU today. Units of this type have a history of activation in wartime to fill a vital function, followed by inactivation at the end of hostilities. Reasons for inactivation have been very consistent in each case: a dislike for elite units, rapid demobilization, and a failure of the Army to capture the doctrinal lessons learned. The meaning of an "elite" unit has changed very little from World War II to the present. During World War II there were very few elite units. Elite status was generally conferred on units that were small and designated to perform other-than-standard missions. In today's Army many units perform other-than-standard missions because of technology-driven specialization. With the activation of TRADOC in 1973, and the Ranger battalions in 1974 (and subsequently the Special Operations Command), the last two problems, distrust for elite units and maintaining doctrinal lessons, have been largely eliminated for those units. However, LRSU do not enjoy the advantages of being a special operations unit, nor should they be considered as such. Since LRSU are not SOF they still have these traditional problems associated with elite units. Still, LRSU serve a vital intelligence gathering function for the conventional commander and need to remain part of the conventional force.

Examining the history of these SOF units, however, gives insight into the problems LRSU has faced in the past, currently faces, and will face in the future, unless corrective action is taken.

The origin of the LRS mission is found in the history of the 6th Ranger Battalion and the Alamo Scouts in the World War II Pacific Theater. Initially the 6th Ranger Battalion performed missions of "employment on amphibious raids and diversionary attacks of limited duration."² During the invasion of the Philippines, the 6th Ranger Battalion performed its most famous mission, conducting the highly successful raid on the prisoner of war camp at Cabanatuan.

The operation was immediately singled out for special comment in the Sixth Army weekly G2 report, which described it as "an almost perfect example of prior reconnaissance and planning" It was further held up as demonstrating "what patrols can accomplish in enemy territory by following the basic principles of scouting and patrolling (sic), 'sneaking and peeping,' [the] use of concealment, reconnaissance of routes from photographs and maps prior to the actual operation, . . . and the coordination of all arms in the accomplishment of a mission."³

Despite the success of the raid, the battalion primarily performed long-range reconnaissance missions for the remainder of the war. These operations were also highly successful. Despite the hazardous nature of these missions only two rangers were killed and three wounded in the months following the Cabanatuan raid.⁴ It was the 6th Ranger Battalion performing long-range reconnaissance missions that, "with time, would become as central to the Ranger concept as the mission of raids."⁵ The Alamo Scouts were also partly responsible for the success of the raid, as they provided critical intelligence to the 6th Ranger Battalion immediately prior to the attack.⁶

The Alamo Scouts were formed in part to conduct long-range reconnaissance missions. Unlike the 6th Ranger Battalion, their mission was to "collect vital information, rescue prisoners, and perform a variety of covert operations."⁷

By late 1943, [Lt. Gen. Walter] Krueger was concerned about the lack of reliable ground intelligence available to his command. As his Sixth Army drove toward the Philippines, it would need advance data on beaches designated for amphibious landings. Furthermore, to operate effectively,

his troops needed reliable information on Japanese troop movements and dispositions. Such intelligence was hard to obtain in the dense jungles of the Southwest Pacific. Aerial photographs could not penetrate the dense jungle canopy, and standard infantry formations lacked the skills for long-range patrols to collect the needed data. The situation clearly called for a special unit.⁸

The Alamo Scouts trained to infiltrate by several means, including sea landing airplanes, parachute drops, and boats. The teams conducted long duration missions and generally consisted of one officer and several enlisted men. The teams conducted 60 missions in two years of combat, including the vital surveillance of the prisoner of war camp at Cabanatuan. The Alamo Scouts were highly effective in their operations and not a single scout was killed during the war.⁹ By contrast, in the European Theater, Ranger units were not nearly as successful.

The European Theater Ranger Battalions generally performed standard infantry missions and suffered because of it. While this added to the lore of the ranger units, it had an equally devastating effect on combat effectiveness as typified by the destruction of the 1st and 3d Ranger Battalions at Cisterna. In the months prior to the Anzio landings and the attack on Cisterna, the 1st, 3d and 4th Ranger Battalions had experienced severe personnel attrition in combat resulting in decreased combat effectiveness.

The conventional fighting to which the Rangers had too often been committed had resulted in severe attrition among their best trained and most experienced men. As their places were taken by replacements who, however brave and highly motivated, had enjoyed nothing equal to the time and training that had been lavished on early Rangers, the Ranger's original quality became diluted and their unit cohesion weakened.¹⁰

Interestingly, there were other little known provisional ranger-type units formed within divisions that performed long-range reconnaissance patrol missions. "In fact, an observer from the War Department, on tour of ten divisions in Europe in the summer of 1945, found that eight had formed permanent or temporary 'ranger' units to meet the need for specially trained men for combat patrolling and other Ranger-type missions."¹¹ The necessities of combat often provide the impetus for doctrinal and force structure changes. World War II division commanders, always short of infantrymen, would not have formed

provisional ranger and patrolling units unless there was a proven combat need. Division commanders desperately needed to gain reliable intelligence. They did so by sending lightly armed patrols into enemy territory. They perceived the need as critical. Unfortunately, the U.S. Army experience with recognized ranger units and the need for long-range reconnaissance patrols would soon be forgotten.

The three principle reasons why the U.S. Army deactivated ranger units and the Alamo Scouts following the end of World War II are discernible: dislike for "elite" units, rapid demobilization, and the failure to capture doctrinal lessons. The Army leadership believed any unit with even limited special training could perform special missions, thus elite units were not needed. In 1951 Major General Reuben E. Jenkins was the U.S. Army Assistant Chief of Staff, G-3. He typified the Army leadership's dislike of elite units. A historian who chronicled the development of rangers in the Army explained MG Jenkins attitude:

To begin with, he believed that the Army, in creating Ranger units, had made a major mistake in setting mental and/or physical standards which were higher than those for an (sic) standard infantry duty, thereby draining away the best soldiers from standard units. To develop morale and esprit in Ranger formations, Jenkins stated, the Army had produced prima donnas. It had also overemphasized the hazards of Ranger duty and, on that basis, had given them extra pay. Actually, he contended, a Ranger's duties were no more difficult or dangerous than those of the average infantryman. As a result, stated Jenkins, "We so oversold ourselves on the special Commando type units that we expected small Ranger units of supermen could accomplish the impossible."¹²

Of all reasons anti-elitism was and is the most indefensible in a professional force. Not concentrating the best soldiers in a few units can in part be explained by having to rely on conscription. It "was common among the higher levels of the Army; many believed that the Army could not afford to concentrate its best soldiers in a few units."¹³ The Army was also concerned about the quality of the average infantry soldier. One study determined that the infantry was the "dumping ground" for soldiers.¹⁴ S.L.A. Marshall's *Men Against Fire* confirmed their fears and added to the desire not to concentrate the best soldiers in only a few units. The Army leadership consistently demonstrated this mindset in the

correspondence of senior European Theater commanders before the 1st Ranger Battalion activated. A historian that examined World War II Ranger Battalions concluded:

Some critics have maintained that the Rangers are superfluous because there is nothing the Rangers do that cannot be done by good conventional infantry. This contention contradicts the lessons of war. Conventional units suffer casualties and are subject to the same consequences of attrition as the Rangers. They, too, suffer the loss of trained men and cohesion that are necessary for success. If troops such as the Rangers are not held in reserve for special missions, there is no assurance that, when such missions are necessary, there will be any unit capable of accomplishing them.¹⁵

This argument also applies to the present day LRSU. If they do not exist and train in peacetime they will not be available on short notice during times of conflict. Long-range surveillance operations require specialized training, and detailed planning and preparation, but time to conduct training, planning and preparation is not always available. "Under such circumstances, only exceptionally well-trained and cohesive units such as the Rangers are likely to succeed."¹⁶ LRSU also require unique long-term training.

During the Korean War, the Army formed ranger companies to conduct typical ranger missions of raids, ambushes, and reconnaissance behind enemy lines. An organization to train these units was established at the Infantry School: The Ranger Training Command. Unfortunately, like the Ranger Battalions of World War II, the units mostly fought as conventional infantry or assault troops. Because of their small size and limited firepower the ranger companies soon fell victim to rapid attrition and were disbanded. Once again (except for the reason of rapid demobilization) the Ranger companies were disbanded because of the failure to recognize the doctrinal need for this type unit and the dislike of elite units.

The only ranger survivor from the period was the organization that trained and formed the ranger companies (renamed in September 1951): the Ranger Training Department. It fulfilled the desires of the conventional-minded leadership to teach patrolling skills to individual soldiers, thus enriching the training of the entire Army, not just a few elite units.¹⁷ The formation of the Ranger Training Department is significant

since it would become the proponent headquarters for LRSU in 1986, teaching long-range patrolling skills that are essential to the mission. While the army leaders were still making the same mistakes with regard to elite units (using them as conventional infantry), they did recognize the need for special individual skills training.

Along with the need for special individual skills, the Army began to recognize the need for specially-trained reconnaissance units. The mission concept and organization for the LRRPs arose in the late 1950s in V and VII Corps in Europe. Both corps experimented with this type unit, culminating in a 1961 Seventh Army directive on their organization and training, and followed with provisional activation of a LRRP company in 1964. In 1965, Seventh Army formed authorized LRRP companies acknowledging "in the case of long-range reconnaissance, many field commanders were willing to concede that the Army would have to rely on special units."¹⁸

The combat proving ground for the present day LRS mission was in the Vietnam War. The Army intended to defeat the enemy forces in Vietnam with large unit conventional operations, but faced a new kind of warfare that it was generally ill prepared to combat. Special Forces brought indigenous forces into the battle with some success. With the deployment of the 1st Cavalry Division in 1965, Vietnam increasingly became a war conducted by conventional units. It was believed that with superior mobility and firepower conventional units could destroy the enemy and isolate the country of Vietnam from the North Vietnamese and the Viet Cong. Russell Weigley summarized the Army's attitude:

The military, both the Joint Chiefs and General Westmoreland in Vietnam, insisted that the enclave strategy give way to a "search-and-destroy" strategy, aimed at denying the enemy freedom of movement not just in selected areas but throughout South Vietnam, at carrying the war to the enemy, and at winning victory by the means sanctioned by the most deeply rooted historical American conceptions of strategy, the destruction of the enemy's armed forces and of his ability to wage war.¹⁹

The U.S. Army pursued the strategy of annihilation until 1972 when the last combat forces were withdrawn.

In order to translate the destruction of the enemy force into tactical success the Army had to develop methods to find a well hidden enemy in very thick and difficult terrain very similar to that found in the Southwest Pacific during World War II.²⁰ Intelligence that could locate small enemy concentrations would enable the tactical forces to use their military might effectively. The Army was forced into "a prolonged combat reconnaissance campaign in Southeast Asia as a result of battlefield circumstances."²¹ This resulted in the proliferation of a variety of high and low-tech intelligence gathering systems. Airdropped or man-emplaced acoustic sensors monitored the Ho Chi Minh Trail with limited success. "People sniffers" detected traces of uric acid. Sophisticated radio intercept equipment attempted to collect intelligence on an enemy that possessed very few radios. The raid on Son Tay even saw the first use of a primitive UAV, but it only produced pictures of the sky.²² The operation, though executed flawlessly, produced no liberated prisoners. The LRRP and other HUMINT systems were the exception to almost every other intelligence gathering system - they produced results.

Divisions arriving in Vietnam soon discovered they needed LRRPs to locate the enemy if they were to bring the enemy to battle. In December 1965 the 1st Division Command Report noted "a Long Range Reconnaissance Patrol Organization is required to locate enemy troops and logistics concentrations for exploitation."²³ This discovery soon led to brigade and higher organizations creating provisional LRRP units with personnel and equipment provided from within the unit. Previous arguments against forming elite organizations rested on having to take the best men from conventional units to man them, but since no LRRP units existed, conventional units had to do just what they had argued against. The Army quickly remedied this situation and by 1968 every separate brigade, division, and field force in Vietnam had an authorized LRRP unit. The nature of the conflict and the Army's lack of attention to doctrinal lessons learned from previous

conflicts, resulted in the creation of LRRPs. Dr. Shelby L. Stanton, a Vietnam era military historian, summarized one of the major lessons of the war:

The unforeseen nature of territorial control and area warfare operations within Vietnam, for which the Army was doctrinally ill-prepared, demanded sustained ground patrols that ventured forward of conventional battlefront reconnaissance sectors, but stayed on operations-level and tactical assignments. The Army long-range patrol and ranger endeavor during the Vietnam conflict was thus largely unexpected and characterized foremost by the field-expedient and decentralized nature of most regular formation recon units.²⁴

In short, the Army was forced to innovate so they could locate and destroy the enemy.

Innovation for any organization is difficult under the best of circumstances. For rigid, hierarchical organizations innovation is more difficult, and for an army in wartime it is especially difficult. Innovation is not impossible under such circumstances; history is replete with successful accounts of wartime innovation, and the LRRP concept maybe a fair example. In a recent book on military organization innovation, Stephen Rosen concludes that during times of conflict innovation has been less successful than in peacetime principally because of the factor of time. In war there is little time to experiment and produce feedback on the system. Rosen states that, "continuity of command can lock in place doctrine adopted early despite subsequent experience, blocking innovation after an initial period of experimentation."²⁵ Using LRRPs as an example of innovation, military historian David Hogan summarized, "LRRPs achieved much in Vietnam, but not as much as a more established force, with adequate doctrine, through training, and superiors educated in its proper use, might have accomplished."²⁶ Unfortunately changes quickly emplaced in times of conflict are often the first to decompose at its end; such was the case with the Rangers of World War II and Korea, the Alamo Scouts and the Vietnam era LRRPs.

The lack of standardized training hurt the ability of the average LRRP unit to successfully conduct missions. The only standard training received was attendance at the two week Military Assistance Command Vietnam (MACV) Recondo School run by the Special Forces (SF). The number of new LRRP soldiers needing to attend the school

quickly exceeded the capacity. In the period of one year (Nov 66 - Nov 67) the Army in Vietnam saw an increase of 88% in LRRP personnel strength from 1362 to 2534.²⁷ Any other training received was at the discretion of the unit and generally consisted of about two weeks of training on patrolling and unit SOPs before commitment to combat.

The lack of doctrine hurt the LRRP concept even more. The lack of doctrine allowed commanders to redefine and expand the LRRP missions as they saw fit, similar to what happened to Ranger units in World War II and Korea. Commanders appreciated their effectiveness in finding the enemy and quickly included ambushes and prisoner snatches. LRRPs received almost universal praise for their conduct of operations in Vietnam. General Peers, the 4th Division Commander stated, "in 1967, before we had any form of surveillance unit such as the people sniffer and the air cav with the scout unit, every major battle that the 4th Infantry Division got itself into was initiated by the action of a Long-Range Patrol; every single one of them."²⁸ Commanders came to rely on LRRPs and placed increasing demands on them. To conduct the ever increasing number and variety of missions commanders expanded the size of LRRP teams and increased their firepower. Like the Ranger Force (1st, 3d, and 4th Battalions) of World War II, the LRRPs became more like conventional infantry units, and suffered accordingly. Following the withdrawal of Army forces from Vietnam, LRRP units were quickly disbanded for the same reasons as the ranger units of World War II and Korea. A new reason now appeared also; in 1974 LRRP spaces paid the bill for activation of the 1st and 2nd Ranger Battalions. The problem of being a bill payer continues to haunt LRSU. However, in the activation of the Ranger Battalions the Army finally admitted the need for specialized units.

The only exception to the inactivation of LRRP units was in the National Guard. The only National Guard unit to deploy and operate in Vietnam was Company D (Rangers), 151st Infantry from Indiana. From February to July 1969 the unit conducted 573 patrols. During this time the unit reported 134 enemy observations, 94 combat actions

and killed 76 enemy soldiers.²⁹ The combat record of the unit was laudable and the unit is still active, now designated as a LRSU.

Modern LRSU began with the designation of the 9th Infantry Division as the high technology test unit in the early 1980's. During this time the "9th ID Scouts" were formed. They were designed to perform reconnaissance and surveillance missions deep in enemy territory (50 - 150 km). They had the capability to perform insertion and extraction by a variety of means to include airborne, Military Free Fall (MFF), helicopter, boat, stay-behind, vehicle, and foot. They were capable of performing these missions for 3-5 days. They did not have the mission nor the capability to perform direct action missions such as ambushes, raids, or the directed capture of prisoners.³⁰ The unit was successful in re-establishing the reliability of this type of HUMINT asset. As a result of the success of the 9th ID Scouts, a force structure change authorized a LRSD in every division and a LRSC in each Corps. By 1988 there were eighteen LRSDs and three LRSCs in the active component. In the National Guard there were an additional seven LRSDs and four LRSCs.

The Revolution in Military Affairs

The current Revolution in Military Affairs (RMA) must consider a host of anticipated rapid technological advancements and the integration of these into the operational concepts and organizations in the Army.³¹ The Annual Report to the President and to the Congress, February 1995 states,

Historically, an RMA occurs when the incorporation of new technologies into military systems combines with innovative operational concepts and organizational adaptations to fundamentally alter the character and conduct of military operations. Information technologies are already dramatically improving the ability to gather, process, and disseminate information in near-real time.³²

The overriding concept to the RMA is integration - essentially new technologies have to be useful to organizations. Additionally, in a practical sense - technologies also have to be

affordable. LRSU have not had a significant equipment upgrade since their inception in 1985. LRSU have continued to receive equipment upgrades as they were distributed to the force as a whole, such as clothing and armaments. Possibly the most critical piece of LRSU equipment has seen only minor changes: communications. Two reasons account for this disparity; LRSU have received little attention from the proponent, but more significantly the technology that is revolutionizing long-range communications has only recently become available.

This section will explore the potential of the RMA for LRSU communications and its possible implications for other intelligence gathering systems. LRSU are plagued by the inability to communicate on request with higher headquarters, inability to achieve reliable long-range communications, and a lack of standardized equipment between units. The RMA can fix all the problems with LRSU communications now, eliminating a significant obstacle to its effectiveness.

The two most readily identifiable examples of the present RMA in intelligence gathering systems are JSTARS and UAVs. Despite their promise, these systems may be less useful in the future than anticipated. Defense analysts disagree on the direction in which the RMA should proceed. Many cite the principle lesson of Desert Storm as not challenging the U.S. "in a contest with mass theater-wide, multidimension forces."³³ They generally agree that future conflicts will be much different than Desert Storm; they will most likely be low-intensity. Information will be key, and the development of an appropriate doctrine is essential. There are still more considerations when evaluating the need for UAVs and JSTARS.

Cost of these systems must remain a major consideration in pursuing them in the RMA. JSTARS is a proven system, but high cost dictates that there will be very few of them. UAVs however are still in their infancy. Dr. Jeffery Cooper, a speaker at the 1994 War College conference on the RMA, questions tight budgetary dollars spent on such systems. He stated, "the very length of time it may take for a new peer competitor to

emerge suggests that the utility of an RMA exploited today with a very narrow focus may no longer be evident at the time a challenge does emerge."³⁴ He goes on to argue that the U.S. military should concentrate in the short term on the integration of RMA technologies to upgrade organizational capabilities that up till now have been deficient.³⁵ LRSU capabilities are a good example of a low-cost system that needs upgrading.

While the RMA could dramatically effect LRSU, there has not been an attempt to do so. Examining the missions of LRSU, equipment can be identified which could result from the RMA. Surveillance, reconnaissance, target acquisition, and battle damage assessment could all profit from the RMA. LRSU can perform all these missions. The primary limiting factor is specialized equipment. Technology is advancing at such a rapid rate that equipment only contemplated 10 years ago is now available or will be available in the near future. It is the responsibility of the LRSU proponent to examine the needs and articulate them to the Army leadership so development and procurement can proceed. The most striking feature of the current RMA is that the technologies available and projected are being designed and produced mostly by civilian companies for commercial use. This could translate into significant cost and time savings to the military. LRSU equipment needs fall into two general categories: LRS specific (but often identical to SOF), and joint forces common. Joint forces common are items that are not specific to LRSU such as weapons, designation devices, night vision equipment, and clothing to name only a few. LRSU have and will continue to be able to obtain these types of equipment as the regular forces does. Communications equipment, however, is a major problem.

LRS specific equipment is principally in the area of communications. The frequency spectrum is a known quantity, one that technology cannot expand in the near future. LRSU need long-range communications, and as such, there are only four areas of the frequency spectrum that are suitable for the ranges needed: high frequency (HF) and three areas that use satellites as the transmission path: ultrahigh frequency (UHF), superhigh frequency (SHF), and extremely high frequency (EHF). These last three

frequencies are only usable for LRSU when transmitted by satellites. Here after they are referred to as "satellite".

Satellite communications is the best alternative since it is highly reliable, easy to encrypt and hard to detect.³⁶ The limited availability of satellite channels and coevolution rule out its use by LRSU as the primary means of communications. Satellite channels are limited in number. Until there are enough satellites and the band widths are increased to provide a near limitless number of channels, LRSU will frequently find themselves unable to gain access. Satellite channels are in such demand that even the highest priority units sometimes can not gain access when needed. LRSU will likely never be high enough on that priority list.³⁷

An additional consideration is the future vulnerability of the satellites themselves. As high-technology armies become increasingly dependent on satellite communications, it can be reasonably assumed that a potential enemy will develop systems to render them inoperable. Everything in nature operates on this principle of coevolution. Dr. M. Mitchell Waldrop in the book *Complexity* describes it as "a kind of Darwinian principle of relativity: everyone is constantly adapting to everyone else."³⁸ If a potential enemy thinks he can paralyze the U.S. forces command and control system by destroying, controlling or otherwise rendering the satellite system inoperable he will do so. The U.S. Air Force demonstrated in 1984 the capability to launch an anti-satellite missile from a suborbital aircraft. The Pentagon determined publicly the Soviet Union had the capability to destroy a satellite with a "killer satellite" in 1977.³⁹ Considering these limitations, it is premature to expend funds on fully equipping LRSU with satellite communications gear.

LRSU and SOF have traditionally used HF as the principle means of long-range communications. LRSU primary means of communications is the AN/PRC-104 radio, known as the Improved High Frequency Radio (IHFR). The IHFR uses technology developed and manufactured in the 1970's. This radio is reliable and lightweight, but has severe limitations. It requires a large number of batteries for sustained operations and even

with the use of directional antennas is highly susceptible to interception, jamming and direction finding. Additionally, it can receive and transmit on only one channel at a time. When used in the field it requires a detailed communications schedule to conserve battery power. LRS teams can only listen for short periods of time, usually four times a day for updated instructions from the higher headquarters. This proved a significant hindrance to operations during Desert Storm and, in the case of the 1st Armor Division LRSD, prevented the doctrinally correct use of the unit.⁴⁰ When General Franks visited the unit prior to commencement of the ground attack, he asked about communications. It was explained that the LRS teams would listen for instructions at six hour intervals otherwise they would be incommunicado. General Franks said this was unacceptable and forbade the deployment of the unit in the manner for which they were trained. Instead the unit obtained HMMWVs and were utilized as additional cavalry scouts.

The limitations of the radio also require the unit to forecast the best frequency to use given the time of day, solar effects, soil conditions and several other factors. To accomplish this feat the unit depends on HF wave propagation charts which are notoriously unreliable.⁴¹ With the AN/PRC-104, LRS teams are able to communicate successfully, on average, less than half the time.⁴²

To complete the communications cycle each LRSD has two base radio stations (BRS) and each LRSC has four BRS. Each BRS has two AN/TSC-128. Each AN/TSC-128 has three AN/GRC-213 (a vehicle mounted version of the IHFR) for receiving messages from deployed LRS teams, and one AN/GRC-193 (the once projected replacement for the AN/GRC-106, the old RATT RIG) for sending messages to deployed LRS teams. There are significant problems with this communications system. First the system did not get a supply line item number designation as a system until 1993. This meant that the "system" was never available through supply channels as a complete system. Units were forced to order over 200 separate components, and then had to assemble the components, often times without instructions. When the Army discontinued the use of HF

radio systems and replaced them with the Mobile Subscriber Equipment, units that had been using the RATT RIG as its BRS were forced to improvise again. It is probable that no two LRSU have the same BRS configuration, resulting in every detachment and company having a different C4 architecture and making synchronized operations between them virtually impossible.⁴³

Solutions to the LRS communications problems are at hand. Mr. Jim Vandergeson, Technical Support Group (Detachment A) of the Office of the Secretary of Defense, explained in very simple terms the current and projected state of HF technology, "The physics of communications are defined, processors are the key."⁴⁴ Anyone who invests in a personal computer is quickly disappointed with the rapid availability of faster and more capable processors. In the case of HF radios this phenomena has been even more dramatic, only becoming evident in the last four years.

In 1992 the concept of Automatic Link Establishment (ALE) became widely known and used in HF radios. ALE allows a pair of HF radios, within seconds, to transmit and receive multiple bursts of radio waves on separate frequencies. The radios then determine the best frequency to use and establish communications transparent to the operator. This technology has led to the concept of Low Probability of Intercept (LPI) and Low Probability of Detection (LPD). The radios establish the best frequency for communications with ALE regardless of the strength (power) of the signal. Thus the radios communicate with very low power signals, combined with directional antennas and modems (commonly called burst devices), making HF radios with these technologies virtually impossible to intercept or detect. Vandergeson estimates that even advanced intercept/direction finding equipment would have to be within 300 meters of the radio to even begin to detect the transmission.

There are additional benefits from the use of this technology. Since the radio processor uses very low power, the operator needs fewer batteries, resulting in less weight and longer mission duration. The processors are becoming more compact even as their

capabilities increase. These advances are resulting in significant size and weight reduction while incorporating a broader frequency spectrum in one radio. It is now possible to have one small, lightweight radio that can communicate across the entire frequency spectrum.

Technology will soon allow LRS teams to communicate with small lightweight radios that are very difficult for the enemy to detect and are very reliable. Still, this capability does still not solve the problem of being able to communicate with a deployed LRS team when ever desired. Recently there have been TV commercials advertising "world wide paging." The ability to page or call on a telephone is enabled through the use of satellites and cellular systems. While this type of system would be unusable by LRSU, it is the kind of system LRSU need for command and control of deployed teams. Fortunately, there is a system that will give a similar response: Global Positioning System (GPS). Each GPS satellite has an internal clock that sends a time check with the positioning signal. A GPS clock receiver can be imbedded in any radio. The radio would be programmed to "awaken" and listen for transmissions based on the GPS clock time, for example, every ten minutes. Because the clock time emanates from the GPS, radios programmed to awaken at the same time could communicate on a regular schedule. If a commander wanted to send a message to a deployed LRS team he would only have to wait until the next ten minute window.⁴⁵ When a message is received, the radio signals the operator in one of a variety of means. Since LRS teams operate clandestinely, the radio could send a vibration to a receiver carried by the operator notifying the operator that he has a message, or, in the near future, the message could simply be automatically illuminated in the soldier's heads-up display. The radio would not require additional battery power since it would only awaken for a short time and then only in the receive mode, which requires significantly less battery power than a transmission. While these new capabilities offer promise, there are still additional problems associated with HF radios and LRSU use of them.

The AN/TSC-128 system has eight radios, two vehicles, two 5KW diesel generators and six personnel in one base station. The system requires separate radios to receive and transmit messages because of the limitations of the radios. With ALE technology all eight of these radios can be replaced with one. One generator and vehicle can be eliminated. The team would only need three operators (because of the need to maintain 24 hour communications, eight hour shifts). LRSU have twice the number of total base stations actually needed to maintain communications. It was believed HF skywave communications had a "skip zone" where communications were impossible because the angle of incidence to the ionosphere would not allow the radio waves to return to the earth's surface. The skip zone required the additional base stations to deploy into the rear area so communications with deployed teams would be more likely. The problem with this relay was that messages had to be physically transferred from one burst device to another, causing time delays and message errors.⁴⁶

This is now known not to be entirely true. Each AN/PRC-104 radio came equipped with an antenna designated as Near Vertical Incidence Skywave (NVIS). This antenna can project HF radio waves in such a manner as to eliminate the skip zone. The problem with the antenna was that it was too heavy and bulky to be carried by a LRS team. The NVIS was also an omnidirectional antenna and was very easily located by the enemy. In the last five years, instructors at the LRSLC have proven the skip zone can be eliminated with the use of standard hand constructed antennas. ALE also helps eliminate the skip zone since the radio can test all the programmed frequencies and find one that achieves communications regardless of distance and atmospheric conditions. Whole base stations can now be eliminated resulting in reduced costs, manpower savings, faster transmission times, and reduction in man-made message errors. The benefits of new radio systems are even greater.

HF radios have always been attractive because of a long range capability, but as previously stated, communications were difficult to achieve. The AN/PRC-104 radio has a

planning range for transmissions up to 2500 miles, but well trained operators could only achieve communications about 50% of the time. There are two new HF radio systems which hold great promise, the AN/PRC-137 and AN/PRC-138. The AN/PRC-137 has a planning range of 4000 miles, and has demonstrated the ability to communicate to 8000 miles. In a recent test conducted in Germany with the AN/PRC-137, (arguably the most difficult area on earth to achieve HF communications) E Company (LRSC), 51st Infantry was able to achieve communications a remarkable 97% of the time.⁴⁷

One final advantage of these new radios needs mention: cost. Almost all the new HF radios are being produced by civilian companies primarily for civilian use (a principle characteristic of the RMA). The AN/PRC-138 radio costs \$20,000 and the AN/GRC-132 (the associated base station radio) costs \$100,000. To outfit a LRSD with a full complement of these radios would cost \$340,000. However, associated with the purchase of these new radios is a reduction in personnel and equipment that is approximately equal in cost savings after one year.⁴⁸ The RMA can provide for LRSU the potential to completely change the manner of doctrinal employment and increase responsiveness to the commander. However, the same holds true with the RMA for other intelligence gathering systems.

The RMA is improving technology to other intelligence gathering systems that also provide the commander with dramatically increased detail and responsiveness. The most striking examples of this new technology are the UAV and JSTARS. UAVs will soon be able to stay aloft for days at a time providing radar, conventional TV and infrared pictures of unprecedented resolution. JSTARS can now provide a long range picture of any moving vehicle on the battlefield. Considering the capabilities of these systems, are LRSU still worth the trouble and the risk? Once the high technology systems are examined, and the advantages and disadvantages revealed, the answer is still a resounding yes.

It would seem a traditional aspect of the American military is to look for a technological answer to existing problems. Writing for The Rand Corporation in 1987,

LTC Charles Cranford, USAF, summarized the American military fascination with technological solutions.

Technological approaches are what Americans seem to try first, e.g., collecting more information using more or bigger sensors, rather than looking for existing information that is not being used. This is probably because technological approaches have the virtue of appearing progressive and non-political, as if adopting them would allow people to build upon assumptions already accepted rather than re-examing beliefs.⁴⁹

The UAV and JSTARS may be good examples of this philosophy.

UAV technology began in its infancy for the U.S. military with the raid on Son Tay in 1970. The raiding party needed last minute intelligence of the compound to properly execute the mission. The Air Force dispatched seven "Buffalo Hunter" automatically piloted vehicles between September and October to photograph the camp. Two were shot down and four had mechanical failure. The last one was sent two days before the mission took place. Once over the area the Buffalo Hunter turned at the last second and got only pictures of the horizon.⁵⁰

In 1982 the Israeli Air Force deployed UAVs to the Bekaa Valley in Lebanon to provide surveillance of Syrian airfields. The resulting mission was a great success and largely attributable to UAVs. The Israeli's lost only one manned aircraft to 87 for the Syrians and destroyed 18 SAM sites all with the help of UAVs.⁵¹ Since then the U.S Military has only fielded one operational UAV system - Pioneer. The Pioneer offers the tactical commander the ability to see the enemy in real time out to about 125 miles.⁵² Other systems being tested are a medium range version of the Pioneer, a more sophisticated UAV called "Predator", and an ultra secret model called "DarkStar". Some industry experts predict that UAVs of the future will be able to fly 3000 miles and stay aloft for more than a day.⁵³ UAVs of the future may have the capability to conduct a wide variety of missions including: reconnaissance, surveillance, target acquisition, and be able to test for meteorological conditions and nuclear, biological and chemical agents. These capabilities are possible with technological advances projected in the future, but at what cost? It is

predicted that in the next decade there will be \$2.6 billion in UAV business.⁵⁴ DOD has designated two UAV systems on the Advanced Concept Technology Demonstrations list.⁵⁵ Development of UAVs are a high priority.

Despite the high priority of UAVs, there are numerous problems associated with them. Already identified is the cost. The only operational UAV, Pioneer, costs \$1 million a copy. The Army has one UAV operational unit (as of September 94), that only has a total of five UAVs. The more advanced systems call for the incorporation of stealth technology, very sophisticated electronic and optical systems, and the ability to fly at very high altitude for long periods of time. These systems will be expensive and the total number of systems will be low. Currently, military pilots will not fly in the same airspace as UAVs because of the fear of mid-air collisions. UAVs are very expensive to operate and maintain, and require robust support systems. In fact, all repair parts are still special ordered from other services; no Army supply channels exist. UAVs have severe flight limitations. The Pioneer can not fly if winds aloft are greater than 65 knots and needs an improved runway for landing and take-off.⁵⁶ Operational tests at the National Training Center identified the best method for employment is for a ground sensor to locate targets and then the UAV to orbit and identify it. Recently two Predator UAVs were lost over Bosnia at a cost of \$10 million each. One is believed to have been shot down. The other malfunctioned and had to be crashed into a mountain to prevent its capture by ground forces.⁵⁷ While the effectiveness of the Predator over Bosnia is still classified, it is publicly known the operating altitude had to be lowered for better picture resolution, which might be a contributing factor to the loss of the two systems. UAVs in the future may offer tremendous capabilities for the intelligence system, but for the near future they are an expensive, low density alternative to LRSU.

JSTARS has a different capability than UAVs. First tested in 1984, the system was hastily deployed to Saudi Arabia for use in Desert Storm. The system proved quite capable in open desert terrain in locating, identifying and accurately targeting moving and stationary

vehicles. Like UAVs however, JSTARS is very expensive. As a result, the Air Force only plans to buy eight systems. Like any airborne system it is vulnerable to enemy attack, electronic jamming, and has weather limitations. More importantly the effectiveness of the system is limited by line-of-sight and vegetation. The system's effectiveness will degrade significantly in forested areas like Europe and may be useless in dense jungle terrain. UAVs may even replace JSTARS, making it obsolete, as there are plans to equip UAVs with the same radar systems as JSTARS.⁵⁸ Like UAVs, JSTARS is no substitute for the capabilities of LRSU.

The RMA is providing technology that has great implications for future military doctrine and organization. The integration of these technologies with doctrine and the assimilation into organizations are keys to their effectiveness. LRSU can make use of the RMA at very low cost. UAVs have the potential to greatly increase the intelligence-gathering capabilities for the commander, but are currently very costly and still in the early stages of development. It may take another five to ten years for UAVs to mature sufficiently to be of real value. JSTARS is a proven, capable system but is most effective in flat desert terrain. Its value in other parts of the world is a possible deficiency. LRSU, on the other hand, need only an effective communications system and a new doctrine/organization to maximize its effectiveness. The solution to the communications problem is at hand. A revised and improved doctrine and a new organization likewise are available.

Eyes Above the World⁵⁹

LRS doctrine is less than 10 years old. The first doctrinal manual was produced in 1987 by officers that had no experience in LRS operations. Since then many aspects of LRS doctrine have matured. An experienced body of officers and NCOs have come to understand LRSU capabilities, limitations and, more importantly, possibilities for this unique intelligence gathering asset. This section will present the background of LRSU doctrinal development and the problems identified by the community in implementing the

original doctrine. Finally, it will propose a new doctrinal framework that when integrated with a new organizational structure and new communications equipment will allow LRSU to be a valuable contributor to FORCE XXI. Since LRS doctrine is less than 10 years old it is easy to trace the problems associated with it.

LRS doctrine was plagued from the very beginning by its too close association with the still emerging special operations community. In early 1986 the Army Special Warfare Center (SWC) was charged with creating a training course and writing doctrine for LRSU. In October of 1986 proponentcy for LRSU was transferred to the Infantry Center, changing responsibility from SWC to the Ranger Training Brigade (RTB) for the Long-Range Surveillance Leaders Course (LRSLC) and the writing of FM 7-93 LRSU Operations. The first edition of FM 7-93 was issued in October 1987, heavily influenced by the original authors at SWC. The two finishing authors at the LRSLC were both veterans of the 75th Ranger Regiment, also part of the Special Operations Command. This influence from the special operations community caused LRSU significant problems. These authors envisioned LRSU as an adjunct to the special operations community but, by unfortunate circumstances, assigned to the conventional force, very much like the LRRPs of Vietnam. As a result, the first edition of FM 7-93 used SOF terms and procedures and caused a mental and doctrinal rift with the conventional forces LRSU were designed to support.⁶⁰

In the previous section on the history of LRSU, the point was made that conventional commanders often misutilized rangers and LRRPs. This also weighed heavily on the authors of the manual and instructors at the LRSLC. Their good intentions did not have the desired results. They produced doctrine that was very specific, perhaps too specific. Commanders had little room to interpret LRSU employment.

LRS doctrine was dogmatic. It specified exact distances and methods of employment. For instance, a LRSD team could only be employed up to 50KMs beyond the Forward Line of Troops (FLOT) and for a maximum of six days. A LRSC team could go up to 150KMs for eight days. On close examination this made no sense. There was no

difference in the make-up of the teams in terms of personnel and equipment, so why the differences in mission distance and duration? What was logical about 50KMs and 150KMs. There were no differences in the insertion means available or team composition, so why the differing distances? Commanders needed useful guides to employment; instead, they received uncompromising gospel.

As new LRSU commanders began to gain experience, the inflexible nature of the 1987 manual became unduly onerous. Two possible battlefield circumstances led to this conclusion; the central European environment and a possible low intensity conflict (LIC) environment.

In 1989 there were four LRSD and two LRSC assigned to divisions and corps in Europe. With the initiation of hostilities, the 60 LRS teams, according to doctrine, would be positioned to support the intelligence needs of the commander based on the Inter-German border as a start line. The question was asked: how would these LRS teams be deployed assuming the FLOT had moved, for example, 200 KMs either way. Assume first the FLOT moved to the west. LRSC teams would now be operating at distances of at least 350 KMs forward of the FLOT, LRSD teams at least 200 KMs. Considering these extended distances, it would be very difficult simply to extract the teams. Additionally, to extract the teams and then prepare them for new missions would be very time consuming, leaving the respective commanders with a much reduced HUMINT capability. If the teams were left in position to whom would they now report? None of them were in their respective commander's area of interest. Now consider the opposite case; the FLOT moves to the east. The LRSD teams would be in friendly territory planning for new missions, and the LRSC teams would be in the division commander's area of interest, but not reporting on his Priority Intelligence Requirements (PIR) or reporting what they see to him. Would the LRSD teams now work for the corps commander since the LRSC teams were in the division commanders' area of interest? If so, how would LRSD teams receive missions? How would they report to corps? It seemed to make sense to "leapfrog" the teams so there

would be continual coverage of the division and corps commander's areas of interests. Unfortunately, communications equipment and SOPs were different. The simple truth was that doctrine and probable circumstances were incompatible. It was evident there was no flexibility in the system, neither doctrinally, nor organizationally.⁶¹

Now consider the second circumstance, LIC. In a LIC environment a light infantry division is faced with the need to provide security and intelligence gathering in all directions. However, a light division has only four LRS teams. Considering the commanders area of interest supposedly extends to 50 KMs, the total area is greater by far than that of a heavy division on a linear battlefield. The first question that arises is why does the light infantry division only have four teams? In truth, there is no correlation between the area of interest needing coverage and the resulting number of LRS teams. The second question is how does the light division bridge the gap between long distance HUMINT intelligence needs and resources? A possible answer is to attach the corps LRSC to the light division or simply increase the number of LRS teams in the division. However, if the corps LRSC is attached to the division, they still have different communications equipment and SOPs, and the corps now has no LRSU. How many more LRS teams does the light division really need for such a scenario? This leads back to the original question; how many LRS teams are enough for a given situation? There is no easy answer since each case is different. What is clear is that none of the proposed solutions solve the real problem. There is no flexibility in LRS doctrine, or organization, and certainly LRSU are not prepared for the battlefield of the future.⁶²

In 1991 the International Long-Range Reconnaissance Patrol School, in Wiengarten Germany, conducted a study to examine the future battlefield and the impact it might have on NATO LRRPs. While the U.S. Army retains the term LRSU, non-U.S. NATO countries still refer to them as LRRPs. There are no substantial differences in the missions of the two forces. The study found that the 21st century battlefield would be almost identical to that described in Force XXI documents, that is, non-linear with widely

dispersed formations. This battlefield scenario requires units to mass and concentrate fires for short periods of time, then quickly disperse. The environment places a premium on intelligence gathering. Only with good intelligence would the friendly force be able to achieve mass and concentrate fires quickly from multiple directions and at extended ranges. Thus the study concluded that rather than fewer LRRPs, or LRSU, more would be needed.⁶³ Unfortunately more LRSU may not be available. To quote an old adage, "we must do more with less."

With these emerging concepts in mind, the U.S. Army Infantry School was charged to rewrite FM 7-93 in early 1992. The authors decided that in order for LRSU to remain a viable intelligence gathering system, flexibility had to be a key feature of the effort.⁶⁴ The first step was to remove arbitrary distances and times; the second was to impress upon LRSU that they must be able to respond quickly.

Previous LRS doctrine specified that teams needed detailed planning guidance and no less than 24 hours of "isolation" to plan (preferably as much as 72 hours). These requirements were all unrealistic given the needs of the commander for responsive intelligence and fluidity of the assumed future battlefield. The authors saw quickly that isolation was a SOF term, not suited to the LRSU mission. "Deliberate" and "hasty" planning were better since they were terms the conventional force used and understood. What was more critical for LRSU to accept was that time is a factor that cannot always be controlled. Doctrine had to accept limited preparation time. The commander and staff needed doctrinal guidance regarding minimum essential planning information that would still allow quick deployment. LRS teams needed to have a reasonable expectation of mission accomplishment. The authors drew on lessons learned from the Combat Training Centers, as this situation often occurred with battalion scouts. This resulted in the identification of critical planning items: mission statement, commander's intent for intelligence, PIRs/IR and associated specific intelligence requirements, enemy situation in the target area, method of insertion, fire support plan, a communications plan, and an

exfiltration plan.⁶⁵ These mission essential planning items gave commanders specific guidance on what the LRS teams needed and still allowed the teams to deploy quickly. Unfortunately, the authors could not solve all of the recognized problems.

The problem concerning flexibility of team employment on a complex battlefield still is unsolved. In the initial draft of the new manual, the authors wrote a section on the procedure for cross attachment of teams between companies and detachments. This required the units, at a minimum, to coordinate and standardize communications SOPs. Deployed teams could then be attached to other LRSU when movement of the battlefield dictated. Although the concept was sound, the authors had to delete the section because it was unrealistic given the fragmented nature of the units and the primitive capabilities of the communications architecture.

At this point, the authors realized that only so much could be achieved by changes in doctrine without basic LRSU organizational changes, combined with improvements in communications equipment, to break the paradigm for employment. The doctrinal link with SOF had been broken, simultaneously reinforcing the ties with the conventional force. However, the basic problems associated with LRSU employment on a European high-intensity, LIC, or Force XXI battlefield were still unresolved. The solution was to change the doctrine and the organization to allow for flexible employment of any number of teams in all situations. Force XXI operations concepts can provide the answer.

Force XXI

The vision for the future U.S. Army is contained in TRADOC Pam 525-5 Force XXI Operations. Force XXI operations demand that the Army of the future be a strategic one "defined by five characteristics: doctrinal flexibility, strategic mobility, tailorability and modularity, joint, multinational, and interagency connectivity, and the versatility to function in War and OOTW (Operations Other Than War)."⁶⁶ This section will provide a review of FORCE XXI characteristics, and suggest how they are likely to influence LRSU.

Doctrinal flexibility is needed in FORCE XXI units principally because the spectrum of future conflict will vary greatly and be multifaceted. The potential for surprise is great. Enemy forces could have equal or greater technological capabilities, or they might simply be based on pure manpower. Even a low-grade insurgency is a distinct possibility. LRS doctrine is more flexible now with the rewrite of FM 7-93, but LRSU must be able to reorganize as circumstances dictate to be truly flexible. With a new organizational structure, LRSU might be able to achieve this flexibility. Another aspect of doctrinal flexibility is one of LRSU greatest strengths; superior personnel.

Doctrine must be flexible enough to allow quality leaders and soldiers to apply the principles of doctrine to each scenario. One of LRSU greatest strengths is its high-quality personnel. Almost all the LRSU leadership positions require Ranger qualifications, and most units maintain a volunteer status. LRSU rely on the individual soldier, his intelligence, flexibility, ingenuity, and ability to react in accordance with intent.

Force XXI units must be strategically mobile. Forces must be lighter, able to reach deeper and be survivable. LRSU are light already. They have a very austere structure and have learned to improvise to maintain themselves. The RMA will provide the communications section of LRSU with smaller, lighter weight equipment even as that equipment markedly increases in effectiveness. LRS teams can deploy early and quickly and operate for extended periods. Intelligence is of such supreme importance in FORCE XXI operations that LRSU must be able to get to the area of operations fast and produce superior results.

Joint, multinational, and interagency connectivity requires each service contribute its unique capabilities to the execution of "full-dimensional operations throughout the depth, height, width, and time of the particular battlespace."⁶⁷ As already noted, a particular and unique strength of LRSU gathered intelligence is little need for sanitation prior to dissemination. This characteristic makes LRSU gathered intelligence particularly valuable to FORCE XXI operations. The information it gathers can be released almost

immediately to friendly forces whoever they may be. Proposed LRSU communications systems would be self contained and light, allowing deployment in a number of ways. For instance, LRSU communications systems could easily be loaded on-board a ship to support naval littoral operations.

Versatility in War and OOTW is an important characteristic of FORCE XXI operations. This characteristic requires the full integration of reserve forces, as "the Nation cannot afford to maintain an *army of armies*."⁶⁸ Additionally, each unit must be able to adapt quickly to any area of the conflict spectrum. This requires a standard doctrine, a flexible organization, and superior personnel to execute. LRSU and their predecessors have proven the ability to operate effectively in different environments. The challenge now is to be able to adapt quickly between environments.

The final characteristics of FORCE XXI operations are tailorability and modularity. These characteristics dictate that organizations must become flatter and less hierarchical. TRADOC Pamphlet 525-68, Concept for Modularity describes these as key elements of force flexibility that "enables support that is expandable, contractible, and able to interconnect diversified functions and capabilities operating in the same area."⁶⁹ Strategic lift is limited and units must be able to quickly reorganize themselves to meet exacting needs. Units must have just enough capability to accomplish the mission and no more. Current LRSU organizations do not provide for tailorability and modularity, although the LRSD organization is a good start. LRSU are allocated to divisions and corps with no ability to combine or collaborate because of differences in communications equipment, SOPs, and a lack of doctrine to guide this effort. This is the major shortfall for LRSU to support FORCE XXI operations but can be corrected by designing a LRS organization using TRADOC PAM 525-68 as a guide.

TRADOC PAM 525-68 provides two approaches to designing units to achieve tailorability and modularity: Modular Designed Elements (MDE) and Functional Emulative Increments (FEI). Each design calls for the unit to be self contained and readily

deployable. The MDE design is similar to support units already in the force structure; for example, a bath and shower unit. The only difference is that under the MDE concept, the unit must have permanently assigned support elements so it can operate independently from its parent unit. The FEI, however, hold more promise for LRSU. A FEI unit is like a "piece of a pie" in that it "provides a reflection of the organization as a whole" without the whole ever requiring deployment.⁷⁰ A FEI would contain all the essential functions that require it to operate independently for a specified time. The parent unit would contain several of these FEI, all exactly alike in form and function. Under this concept, the FEI can deploy separate from the parent unit without loss of effectiveness. It can also connect with other FEI regardless of the parent unit. With only minor modifications, a LRSD could become a FEI. Additionally, there would need to be a headquarters with the responsibility to integrate LRSU FEI.

LRSU already emulate many of the characteristics needed to support FORCE XXI operations; strategic mobility, and the versatility to function in War and OOTW, and in part, doctrinal flexibility. Joint, multinational, and interagency connectivity could be provided, in large part, by the acquisition of new communications equipment. Currently LRSU can not fully support doctrinal flexibility and do not have the characteristics of tailorability and modularity. Doctrinal flexibility has already been recognized as a critical need by the writers of FM 7-93, but a new LRS organization is needed to make this possible. Tailorability and modularity can also be achieved with the reorganization of LRSU. The new LRS organization must also provide for standardization of communications equipment, SOPs, integration of reserve components and tailorability and modularity in the form of FEI.

LRSU for FORCE XXI

Previous sections of this paper have explained why LRSC and LRSD can not combine and operate effectively while gathering intelligence. These reasons centered on the

lack of suitable doctrine, problems with communications equipment, different unit SOPs and an organizational structure that does not provide flexibility. They also prevent LRSU from effectively supporting FORCE XXI operations. This section examines previously proposed solutions and explains why they are insufficient. It will also propose a battalion-level structure that will be able to integrate and coordinate the battlefield functions of all LRSU and meet the criteria for FORCE XXI operations.

Major James Marks, School of Advanced Military Studies graduate in 1990, correctly identified part of the problem but suggested an incomplete solution. He postulated that a division, assigned the task of a Joint Task Force (JTF), had insufficient LRS assets to adequately perform intelligence gathering.⁷¹ He concluded that the LRSC in a contingency corps was largely a wasted asset in such a scenario and all but six of the 18 LRS teams at corps should be reassigned to divisions. Unfortunately this logic only "robs Peter to pay Paul." If in the next scenario the contingency corps is tasked as the JTF headquarters, it will have a shortfall in LRS HUMINT collection ability.⁷² Therefore, this solution does not fit the requirements for flexibility (specifically modularity and tailorability) to support FORCE XXI operations.

In 1987 Master Sergeant James England, USA (Ret.), a Vietnam era LRRP team leader, wrote about his battlefield experiences and suggested a new organization for LRSU. MSG England explained in great detail the success of LRRPs in Vietnam, not only in performing reconnaissance missions, but as combat units fighting the enemy. He also correctly identified the need for a higher-level organization to "coordinate doctrine and employment."⁷³ He wrote that in Vietnam there were no "higher headquarters that could review methods and doctrine, evaluate, and direct changes." Based on his experiences, MSG England recommended a battalion and regimental organization to perform these functions. MSG England also saw LRSU with different missions than they have today. He envisioned LRSU as hybrid Ranger/SOF units, assigned to the Special Operations Command, that would actively seek combat with enemy forces. In fact, the Ranger

Regiment and Special Forces units have the capability and responsibility to conduct these missions. Expanding the LRSU capability in this manner risks alienating them from the conventional force they are designed to support. LRSU do not need a regimental headquarters to achieve the desired flexibility and capabilities needed to support FORCE XXI operations. The establishment of a regimental headquarters would require additional personnel authorizations that would probably reduce the total number of LRS teams available. Standardization of equipment and communications SOPs does not require a regimental headquarters. Finally, a regimental headquarters would have no wartime function and only add a bureaucratic layer to the employment of LRS teams. By comparison, a battalion headquarters requires fewer personnel. It could still standardize equipment and communications SOPs, and it would have an important wartime operations function directly aiding LRSU employment. MSG England also commented that LRRP commanders provided some continuity but, "unfortunately, too often they were lieutenants or captains, with too little experience, to effect changes when their teams were being misused."⁷⁴ Essentially, the same is true of today's LRSU organizations.

LRSD and LRSC are commanded by company grade officers often with limited professional experience and practically no experience or training in LRS doctrine and employment. This is also true for LRSU NCOs (less than 20% ever attend the LRSLC). The Joint Readiness Training Center identified this lack of institutional training as a major deficiency to LRSU readiness as early as 1990.⁷⁵ While division and Military Intelligence battalion commanders may believe their LRSU are combat ready, experience proves otherwise. An integrated, consolidated LRS battalion-level organization would ensure standardized training and better utilization of resources for all LRS teams in the command. For the reasons cited above, a battalion-level organization consolidating all LRSU at corps level would optimize their capabilities.

In order to provide a basis for the reorganization for LRSU into battalion-level structures, it is necessary to detail the current structure of detachments and companies.

There are currently five LRSD and four LRSC in the active component. The 2d Infantry Division, 10th Mountain Division (L), 25th Infantry Division (L), 82d Airborne Division, and the 101st Air Assault Division each have a LRSD. I Corps, III Corps, V Corps, and the XVIII Corps all have LRSCs. These units together comprise a total of 98 LRS teams. (The U.S. Army decided not to provide personnel for the heavy division LRSDs in 1995.) The National Guard also has LRSU. In the reserve component there are currently seven LRSD and three LRSC, all assigned to divisions or active component corps.⁷⁶ It is not known at this time which reserve units will remain after the drawdown, current plans call for at least five divisions.⁷⁷ This will add 30 LRS teams to the structure. The resulting total of 128 LRS teams will be used in the proposed reorganization of LRSU. The new structure can have no more personnel (preferably less) than are currently authorized. There must be a marked increase in LRSU capability as a result of the reorganization. The reserve components must also be integrated into the new structure. Finally, it must satisfy all of the characteristics of FORCE XXI operations. The new organization must be capable of providing support to the entire force in a flexible manner.

At the heart of this proposed organization is the LRS battalion. (See Figure 1, page 40) The LRS battalion would be a small, highly deployable unit that contains the essential characteristics needed for FORCE XXI operations. Tailorability, modularity, and doctrinal flexibility would be gained by LRS battalions containing LRSC (FEI) that are identical in composition and capability. In addition to meeting all the criteria of supporting FORCE XXI operations, the LRS battalions would still maintain all the inherent capabilities of LRSU, and would solve the problems associated with the current doctrine. The LRS battalions will insure uniformity of training and unit SOPs. The communications equipment provided by the RMA, as already detailed, would enable multiple communications nodes capable of controlling a wide number of LRS teams. The battalion headquarters would coordinate these functions during peacetime and act as a coordinating cell for LRS operations wherever needed during operations much the same as a Special

Operations Coordination and Control Element does now for SOF. The battalion headquarters could serve in this capacity whether attached to a JTF, a corps, a division or even a brigade. The battalion headquarters element would contain a minimum of administrative and logistics capabilities needed to support the LRSC during peacetime training.

In this reorganization a LRS battalion would be assigned to each corps. It is important to remember that under the FORCE XXI concept, an FEI, even though a part of a higher level organization, must be independent in its capability to perform its designed mission. LRS battalions would have this capability. The FEI would be a modified LRSD (here after referred to as LRSC) with two additional medics and an intelligence NCO. Each LRSC would be capable of functioning independently. If a division is assigned the mission to serve as a JTF, any number of LRSC could be attached to support the force. If needed, the entire LRS battalion could be attached. If more LRS teams are needed, one or more LRSC from another battalion could be attached to the JTF, or even another LRS battalion. If a corps was assigned the mission as a JTF, one or more LRS battalions could be attached, again depending on mission requirements. This flexibility would also carry over to on-going operations once teams are deployed.

The new LRS battalion would have organic to it three LRSC of eight teams each. This number of LRSC is limited only by the current number of teams in the force structure. The battalion could control as many as seven LRSC. It would serve the vital function of providing doctrinal and tactics, techniques, and procedure expertise to the supported commander. The battalion could accept additional LRSC in attachment from other battalions, or from the reserves, to provide the force necessary for a particular operation. The personnel composition of the teams would be unchanged from the current TO&E.⁷⁸ Company headquarters would also remain the same as currently authorized in the LRSD except with the three additions already noted. The communications section would be cut from 13 to six personnel when advanced communications gear is procured. The

headquarters personnel in the current LRSC would be used to provide personnel for the LRS battalion headquarters. Proposed is an LRS battalion for each corps in the force structure (assume I, III, V, and XVIII corps will remain active). Each corps would have an assigned LRS battalion. (See Figure 2, page 41) It is important to remember that each battalion, or LRSC, would be available for attachment to other LRSU as part of the FEI concept of FORCE XXI operations.

The LRS battalions, with standardized communications equipment and SOPs, could cross attach LRSC or even teams during ongoing operations. LRS teams would be deployed with the initial phase of operations. As the shape of the battlefield changes, the LRS teams could be cross attached while deployed to cover any specified area of interest. The deployed teams could immediately be sent new intelligence requirements based on the needs of the commander in whose area they are now operating. Without ever having to move, deployed LRS team could achieve the same results as if the old team had been extracted and a new team deployed. The only disadvantage to this mode of employment is that team members would have to understand the doctrine and enjoy a high degree of confidence in the higher headquarters. This can be accomplished with training and the establishment of a higher organization in peacetime that consistently practices this doctrine. Under the current doctrine and organization this degree of flexibility is impossible.

The doctrinal proponent, the Infantry Center (specifically the RTB) would insure uniformity of training and SOPs across LRS battalions. Doctrine would specify this coordination as a necessary precondition to LRSU employment. LRSC would then be capable of cross attachment between battalions as needed by the mission. These capabilities insure modularity and tailorability, before deployment and while conducting missions.

To support FORCE XXI operations, reorganization of LRSU in the force structure is an absolute necessity. Then JTF commanders, whether at brigade, division, or corps, would have a LRS organization that could be tailored to meet their exact need in any

situation. This is accomplished by standardizing the LRSC into FEL, providing standardized communications equipment made possible by the RMA, standardizing unit SOPs, providing applicable doctrine, and creating battalion-level headquarters capable of training the unit in its mission. Under the current doctrine and organization this is not possible and without it LRSU will continue to be fragmented and incapable of supporting FORCE XXI operations.

Conclusion

The LRS concept has many shortcomings in its current state. These problems include inflexible operating doctrine and an organization structure that prevents LRSU from coalescing effectively while gathering intelligence. FM 7-93 Long-Range Surveillance Unit Operations is the capstone manual. Originally written in 1987, heavily influenced by Special Forces doctrine, it was rewritten in 1992. The manual was approved for publication in 1993, but is still awaiting funds for publication. The proponent, the Infantry Center, places little emphasis on LRSU. The rewrite of the manual attempts to change doctrine to promote cooperation between LRSU, but without a change in organization and communications equipment it is unlikely the units will realize their full potential.

The history of LRS lies in the 6th Ranger Battalion, and the Alamo Scouts of World War II, the ranger companies of the Korean War and most significantly in the LRRPs of the Vietnam War. These units were plagued by the dislike the conventional force had for elite units, rapid demobilization, and the failure to understand the doctrinal need for such units. The Army, having accepted the need for units that perform special battlefield functions, must make the best use of them.

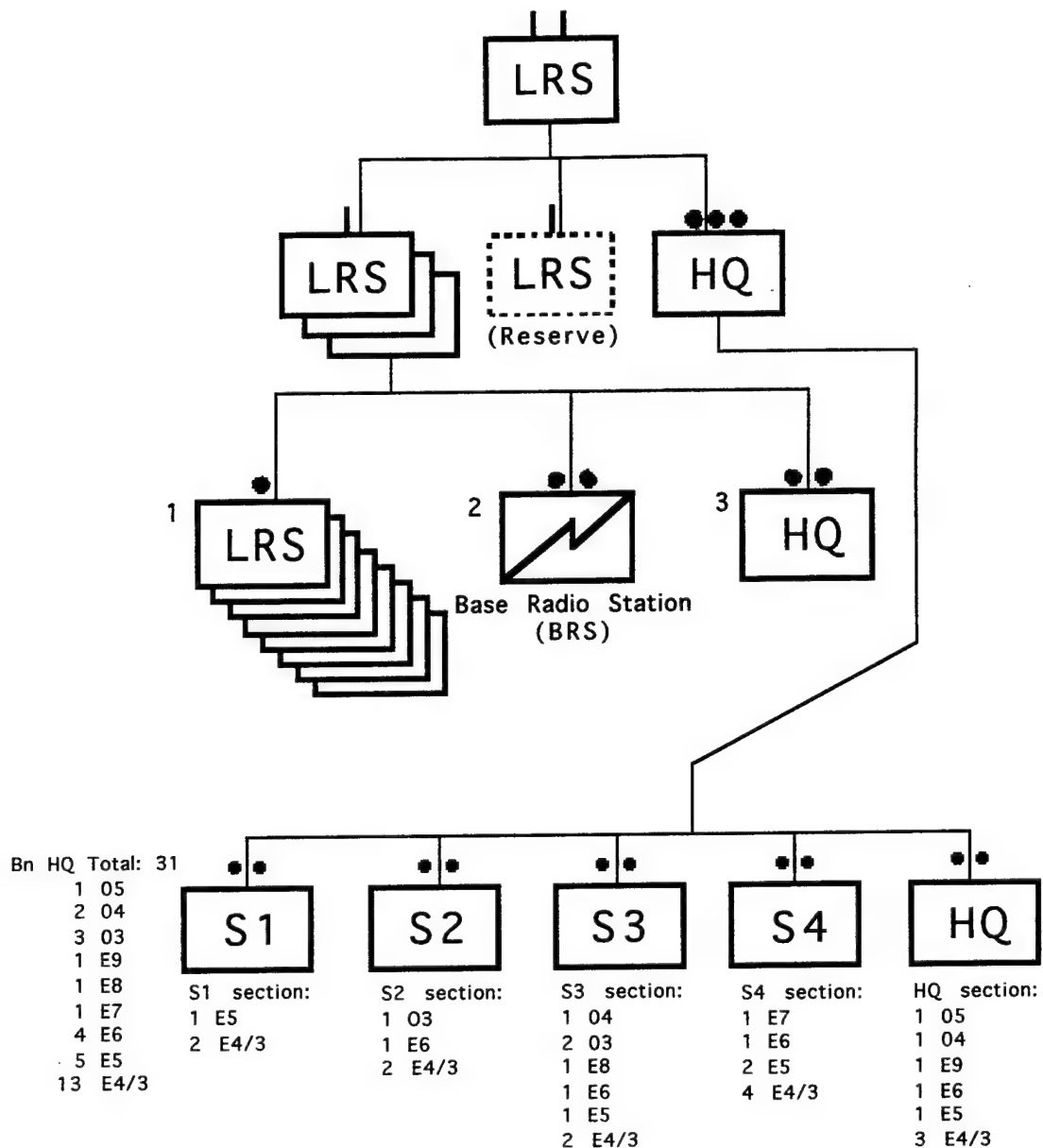
In order for LRSU to achieve full potential in intelligence gathering, separate detachments and companies need to be combined into a standard organization that promotes flexible employment. Doctrine needs to change concurrently to provide commanders with a

framework that standardizes operating procedures. The most important changes need to occur in the area of C4.

A significant benefit of the proposed reorganized LRSU force structure, would be to standardize, procure, and promote the development of C4 equipment. LRSU do not now have standard C4 equipment. Equipment now in use is highly susceptible to enemy interception and jamming. The RMA has already produced equipment (or projected in the near future) that can provide LRS teams and the controlling headquarters almost instantaneous two way communications. These systems are nearly impossible to intercept or jam, and allow maximum use of the high frequency radio wave spectrum.

The LRS concept is poised for a significant advance with Force XXI and the RMA. The Force XXI vision can revitalize the LRS concept. The RMA can open areas only dreamed of by LRSU proponents in previous years. Together Force XXI and the RMA provide the impetus for the LRS concept to achieve its full potential for gathering HUMINT.

By reorganizing separate LRSC and LRSD into battalions, LRSU can maintain all their inherent capabilities and achieve an unprecedented advance in capability. This new capability, combined with high-technology systems such as UAVs and JSTARS may produce a near-seamless intelligence gathering capability. LRSU are not a panacea in isolation, just as advanced intelligence gathering systems are not. All these systems have strengths and weaknesses. Only through combinations that capitalize on complementary capabilities, can maximized effects be realized. LRSU have the potential to provide an indispensable part of the intelligence system that is needed to make FORCE XXI a reality.

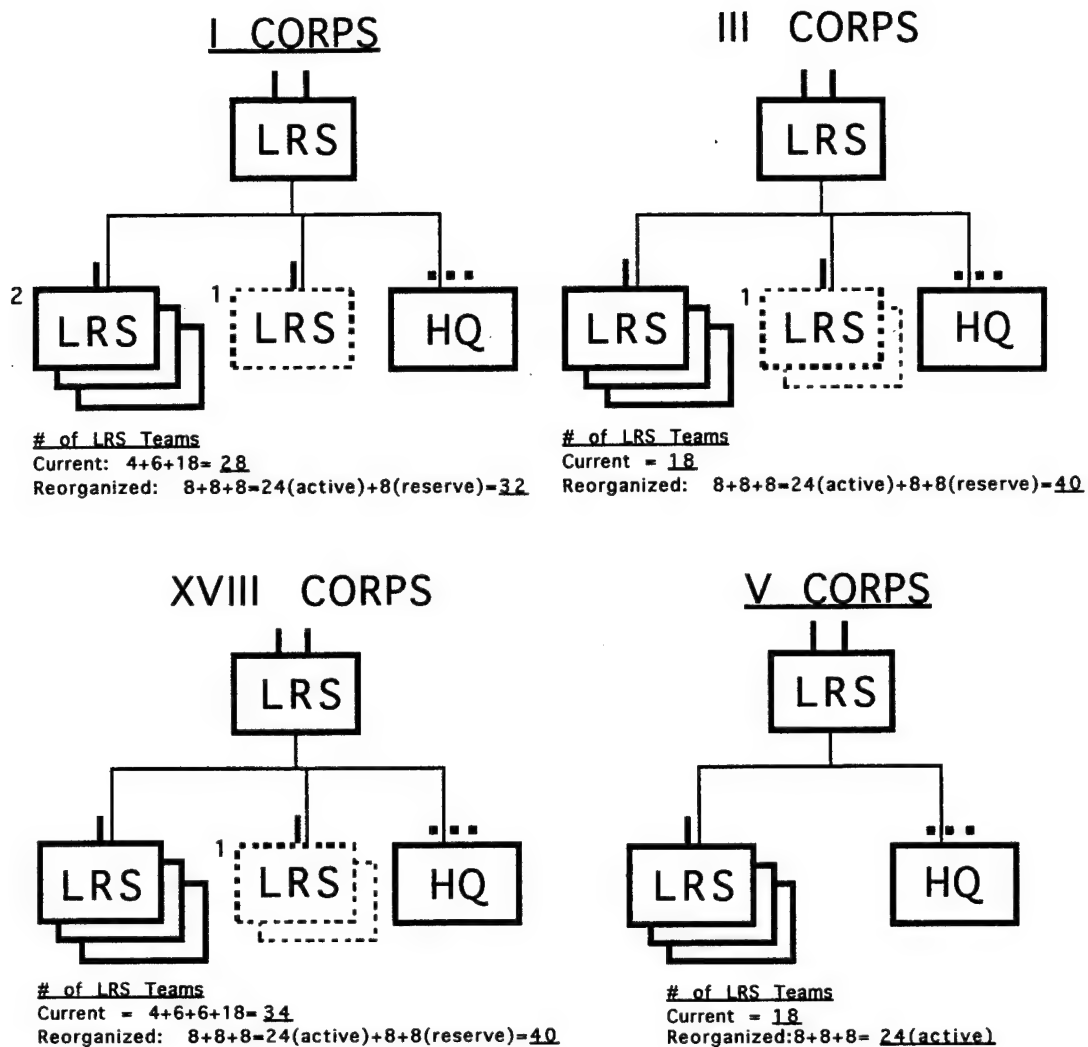


Note1: Current LRS team organization has 6 personnel. With advanced commo equipment, made possible by the RMA, it may be possible to reduce the team to 5.

Note2: Current LRSC has 4 BRS for a total of 8 vehicles and 30 personnel. Current LRSD has 2 BRS for a total of 4 vehicles and 13 personnel. The BRS for the reorganized LRSC, with advanced commo equipment, made possible by the RMA, would have 2 vehicles and 6 personnel.

Note3: Current LRSC HQ has 55 personnel. LRSD HQ has 7 personnel. The reorganized LRSC would have the same HQ as the LRSD, with the addition of 2 medics and 1 intel NCO. (This addition is already planned.)

Figure 1: FORCE XXI LRS Battalion



Total personnel in current LRS structure (active) = 908.
 Total personnel in proposed reorganization (active) = 904.

Note 1: Denotes possible assignment of reserve LRSC.

Note 2: A LRSC could be forward deployed on a rotational basis with 2d ID.

Figure 2: LRSU Support to Corps for FORCE XXI

ENDNOTES

1. Richard E. Simpkin, Race to the Swift: Thoughts on Twenty-First Century Warfare, (New York: Brassey's Defence Publishers, 1985), p.169.
2. David W. Hogan Jr., The Evolution of the Concept of the U.S. Army Rangers, 1942-1983, (Duke University Press, 1986), p.181. This is a paraphrase from a conversation between GEN. MacArthur and LTG Krueger on Dec. 28, 1943. Hereafter this reference is listed as: Hogan (Evolution).
3. Michael J. King, Rangers: Selected Combat Operations in World War II, (Fort Leavenworth, Kansas: Combat Studies Institute, United States Army Command and General Staff College, June 1985), p.71.
4. Ibid., p.71.
5. Hogan (Evolution), p.196.
6. David W. Hogan Jr., Raiders or Elite Infantry? The Changing Role of the U.S. Army Ranger from Dieppe to Grenada, (Westport, Connecticut: Greenwood Press, 1992), p.86. Three Scout teams were assigned to provide surveillance of the camp. On 29 January the Scouts recommended postponement of the raid until the 30th because of heavy traffic. When the raid took place on the 30th, two Scouts provided up to the last minute intelligence by disguising themselves as natives and watching the camp from across the road. Hereafter this reference is listed as: Hogan (Raiders).
7. Hogan (Evolution), p.214.
8. Hogan (Raiders), p.82.
9. Hogan (Evolution), p.215.
10. King, p.31.
11. Hogan (Evolution), p.206.
12. Ibid., p.301
13. Ibid., p.197.
14. Hogan (Raiders), p.97. A study conducted by the Army's Information and Education Division found the infantry generally received soldiers that had passed all the physical requirements but were unsuitable for other service because of low test scores. S.L.A. Marshall found in his interviews with infantry units, after combat, that only 25% of those engaged fired their weapons. It appears the assumption made was that the 25% that did fire were the best soldiers and might be inclined to join these "elite" units, further hurting the average infantry unit.
15. King, p.75.
16. Ibid., p.75.

17. Hogan (Evolution), p. 301-302. This was the view of MG Reuben E. Jenkins, Assistant Chief of Staff , G-3, presented in a memorandum to the Chief of Staff, Gen. Lawton Collins on 27 August, 1951. In the memorandum Jenkins presented his views for why the Korean War ranger companies were a failure, recommended their disbandment and the establishment of the Ranger course at Fort Benning under the Ranger Training Department.
18. Hogan (Evolution), p.375.
19. Russell F. Weigley, The American Way of War, (Bloomington, Indiana: Indiana University Press, 1973), p.464-465.
20. Hogan (Raiders), p.169. Hogan describes how U.S. commanders tried to find the enemy in the jungle terrain. The comparison to the World War II Southwest Pacific Theater is my own.
21. Shelby L. Stanton, Rangers at War: Combat Recon in Vietnam, (New York: Orion Books, 1992), p.312.
22. Benjamin F. Schrmmer, The Raid, (New York: Harper and Row, 1976), p.81.
23. Hogan (Evolution), p.443.
24. Stanton, p.312.
25. Stephen P. Rosen, Winning the Next War: Innovation and the Modern Military, (Ithaca, New York: Cornell University Press, 1991), p.27.
26. Hogan (Raiders), p.184.
27. Stanton, p.313.
28. Hogan (Raiders), p.183. Many military commanders and even civilian critics of the U.S. Army in Vietnam commented favorably on LRRPs. MG John H. Hay, 1st Infantry Division, stated LRRPs were "one of the most significant innovations of the war." Robert Asprey, a noted U.S. Army critic, even "had favorable words for the patrols."
29. Stanton, p.241.
30. Operational Concept, 9th Infantry Division (Motorized), "Part II Unit Concepts. Coordinating Draft" Department of the Army, Army Development and Employment Agency, Fort Lewis, Washington, 2 April 1984. p.F-I-1, F-I-2, F-I-3.
31. TRADOC Pamphlet 525-5, Force XXI Operations, (Fort Monroe, Virginia: Department of the Army, 1994), p.2-8.
32. Annual Report to the President and the Congress, (Washington: U.S. Government Printing Office, February 1995), p.107.
33. Jeffery R. Cooper, Another View of the Revolution in Military Affairs, (Carlisle Barracks, Pennsylvania: Strategic Studies Institute, United States Army War College, Strategic Studies Institute, 15 July 1994), p.8.
34. Ibid., p.11.

35. Ibid., p.12.

36. In my experience as a LRSD commander, an Observer/Controller at the National Training Center (light infantry scout O/C), and as the LRSLC commander, I was required to evaluate numerous communications systems and judge their effectiveness for reconnaissance forces. CPT (P) Derrick Orndorf was my signal officer and assistant in the LRSLC. He frequently instructed me on the use of various communications equipment available to the U.S. Armed Forces. The use of HF and satellite communications was, and is, a particularly important subject to Special Operations Forces and LRSU.

37. Interview with CPT (P) Derrick Orndorf, Signal Officer, B Team, 1st Battalion, 5th Special Forces Group (Former LRSLC Signal Officer, and co-author new FM 7-93), 11/19 July 1995. This information was provided by CPT Orndorf and confirmed by my own experiences. CPT Orndorf was the signal detachment commander for the 75th Ranger Regiment following his assignment as the LRSLC communications officer.

38. M. Mitchell Waldrop, Complexity. (New York: Simon and Schuster, 1992), p.259.

39. John S. Prall, MAJ (USA) Space and the Airland Battle. (Fort Leavenworth, Kansas: Thesis, Master of Military Arts and Science, United States Army Command and General Staff College., 1991), p.64.

40. This was reported to me by SSG Todd Hibbs, instructor LRSLC (June 1992). He and I were first acquainted when, as a E-4, he was attached to D Co. (LRSD) 533d MI BN (CEWI) during REFORGER '88 (September 1987). The 1st Armor Division LRSD was just activating and the commander wanted his soldiers to gain experience in LRS operations. SSG Hibbs was with the 1st Armor Division LRSD until his reassignment to the LRSLC in May 1992. He eventually became an LRS team leader with the 1st Armor Division LRSD and deployed with the unit to Operation Desert Shield/Desert Storm. He was with the detachment commander and General Franks when the conversation took place.

41. Memorandum for: Commandant, United States Army Infantry Center, "After Action Comments from Desert Storm Long Range Surveillance." (Fort Benning, Georgia: Ranger Training Brigade, 21 August 1991), p.2,3. This was a constant concern for the LRSD communications section in the 533d MI BN and the LRSLC. Propagation charts are only forecasts of possible reliable frequencies. There are also computer programs that help predict frequencies. Generally, LRSU get to the operational area and must conduct communications exercises to find reliable frequencies. Even after good frequencies are found they can degenerate at any time.

42. Conversation with Mr. Jim Vandergeson, GS-13, Technical Support Office, Office of the Secretary of Defense, Alexandria, Virginia, 13 July 1995 and 30 October 1995. A phone interview was conducted with Mr. Vandergeson in which the technical aspects of HF, and satellite communications were discussed. During the conversation he explained the test comparing the AN/PRC-104 and the AN/PRC-137. The test was conducted in Germany, with the cooperation of E Co. (LRSC), 51st Infantry. He explained that Germany is considered the hardest location in the world to achieve HF communications because of the density of electronic equipment. I was unable to obtain a copy of the test results, as they are classified. E Co. was so impressed with the capabilities of the radio that the European Command and the Military Intelligence Center combined to completely outfit the unit with the AN/PRC-137. Unfortunately, this will only add to the incompatibility of LRSU communications systems. As of 1 November 1995 the Infantry Center has endorsed buying the AN/PRC-138 radio system as the replacement for

AN/PRC-104. The information concerning the intent of the Infantry Center was obtained in phone conversations with CPT Kevin Hineman, Commander LRSLC, Delta Company, 4th Ranger Training Battalion, Fort Benning, Georgia, 13 July 1995, 25 September, 1995, 7 October 1995, and 7 November 1995.

43. This was and still is an insurmountable problem for most LRSU. After the Army discontinued use of the AN/GRC-106 HF RATT RIG system, these systems became available for use by LRSU and some still use them. In the fall of 1992, as more units began to receive the components for the AN/TSC-128, the LRSLC sent complete wiring and mounting instructions to LRSU attached to the Coordinating Draft, FM 7-93. This was in response to requests from the field. These findings were also confirmed by MAJ David McBride. He was a co-author to the rewrite of FM 7-93 and assumed command of the LRSLC in August 1992. Prior to assignment with the Ranger Training Brigade, MAJ McBride served as the LRS O/C at the Joint Readiness Training Center.

44. Vandergeson, 13 July 1995.

45. Vandergeson, 13 July 1995. In our initial conversation, I asked Mr. Vandergeson about the prospects for this kind of capability. He informed me that this was available now with the use of GPS. Currently, the AN/PRC-137 and AN/PRC-138 do not have this capability.

46. This finding is based on personal experience, conversations with LRS commanders and instructors at the LRSLC. After every mission, a detailed communications debriefing was conducted with the team radio operator and the communications section. Transferring of messages often contributed to time delays and more often message errors. Several solutions were adapted to reduce the problem. Printers were improvised, or the message device was physically transferred to the sending radio. This problem also arose at the LRSLC. CPT Orndorf experimented with NVIS transmissions and proved their reliability using hand constructed antennas. This technique was added to the LRSLC program of instruction in the summer of 1992.

47. Vandergeson, 13 July 1995.

48. This estimate is based on figures provided by Mr. Vandergeson, 13 July 1995.

49. Charles J. Cranford, LTC (USAF), Intelligence and the Tactical Application of Firepower: the basic problem is human, (Rand, 1987), p.21.

50. Schrmmer, p.81.

51. Richard A. Gabriel, Operation Peace for Galilee, The Israeli-PLO War in Lebanon, (New York: Hill and Wang, 1984), p.98-99.

52. P. K. Tanguay, COL (USA), "First Production Hunter UAV Accepted." Army Aviation, 31 May 1995, p.58.

53. Michael E. Ruane, "Pilotless spy planes travel uncertain skies." Tallahassee Democrat, 23 August 1995, p.3A.

54. Ibid., p.3A.

55. Annual Report to the President and the Congress, (Washington: U.S. Government Printing Office, February 1995), p.110.

56. Adam R. Hinsdale, "Pioneer: Nemesis in the Desert Sky." Military Intelligence Professional Bulletin, July-September 1994, p. 14.
57. David A. Flughum, "Two Predators Destroyed in Bosnia." Aviation Week and Space Technology, Vol. 143, #8, 21 August 1995, p.24-25.
58. David A. Flughum, "Army Pushes Missiles for UAV Use." Aviation Week and Space Technology, Vol. 143, #8, 28 August 1995, p.23.
59. This is the unofficial motto of the LRSLC.
60. I attended the LRSLC in October-November 1987, shortly after it moved from Fort Bragg and just as FM 7-93 was being published. I was able to talk extensively with the two authors and gain understanding as to their intent in writing the manual.
61. This problem in LRS doctrine first became apparent during preparations for REFORGER '88. The problem resurfaced again in discussion of the General Defensive Plan with CPT (now LTC) Patrick McNeese, the 3d Armor Division intelligence collection manager. I expounded on the problem while serving as the LRSLC commander and posed it to participants of the 1993 LRS Commander's Conference, June 1993.
62. MAJ David McBride had extensive experience with the problems associated with this scenario. He commanded the 25th Infantry Division LRSD prior to serving as the LRS O/C at JRTC and then as the LRSLC commander.
63. Memorandum for: Commanding General United States Army Infantry Center, "After Action Report: International Long Range Reconnaissance Patrol School Symposium 1991.", Weingarten, Germany: USAIS Liaison Office, International LRRP School, summer 1992. The Infantry Center no longer maintains a Liaison Officer at ILRRPS.
64. MAJ David McBride, CPT (P) Orndorf, and myself concluded this needed to be a critical feature of the rewrite in the spring of 1992.
65. Field Manual 7-93, Long-Range Surveillance Unit Operations. (Washington: Headquarters Department of the Army, undated, supersedes 9 June 1987 publication), p.2-31. I served as a light infantry scout O/C at the NTC from May 1989 to January 1992. It was evident that the problems associated with quick deployment of light scouts was very similar to those encountered by LRS teams.
66. TRADOC Pamphlet 525-5, Force XXI Operations. (Fort Monroe, Virginia: Department of the Army, 1994), p.3-1.
67. Ibid., p.3-2.
68. Ibid., p.3-2.
69. TRADOC Pamphlet 525-68, Concept for Modularity, Operational Concept. (Fort Monroe, Virginia: Department of the Army, 1994), p.4.
70. Ibid., p.4.
71. Marks, James A. MAJ (USA), Just Do It: Close the Intelligence Gap. (Fort Leavenworth, Kansas: Monograph, School of Advanced Military Studies, United States Army Command and General Staff College., 1989), p.1.

72. Ibid., p.29.

73. James W. England, Long Range Patrol Operations: Reconnaissance, Combat, and Special Operations. (Boulder, Colorado: Paladin Press, 1987), p.45.

74. Ibid., p.5.

75. This received the particular interest of MAJ David McBride when he served as the commander of the LRSLC from August 1992 to May 1993.

76. Phone conversations with CPT Kevin Hineman, Commander LRSLC, Delta Company, 4th Ranger Training Battalion, Fort Benning, Georgia, 13 July 1995, 25 September, 1995, 7 October 1995, and 7 November 1995.

77. Annual Report to the President and the Congress., p.31.

78. The six man team configuration has proven to be about the right size. Most TO&Es of LRRP teams called for six men. European LRRPs generally have five or six men on a team. The 75th Ranger Regimental recon teams have five men on a team, but they carry lighter weight and more advanced communications equipment than LRS teams. The weight of the equipment a team must carry requires six men to distribute the load. With the acquisition of new communications equipment it may be possible to reduce the team to five personnel.

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